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POPULARIZATION OF MAIZE (DHM 117) AMONG THE SMALL FARMERS OF MAHABUBNAGAR DISTRICT OF TELANGANA THROUGH FRONTLINE DEMONSTRATION

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ABSTRACT

A total of 20 fields of farmers residing in Mahabubnagar district of south zone of Telangana state were selected for the experimental study. The field studies were conducted by the Krishi Vigyan Kendra, Palem to evaluate the production and economic benefits of maize (DHM 117) production by applying scientific technology. The crop cultivated during the kharif season of 2012-13 and 2013-14 (two consecutive years) and June to October was selected for testing and analyses. The fields of the farmers were located in the village of Chenchugudem, Gudibanda and Chakalpalyy. Extension gap, technology gap and technology index were calculated. On the basis of these technologies, improved production in the hybrid DHM 117ranged between 36 and 54 q/ha for 2012 (mean yield 44 q/ha) and between 39 and 49 q/ha for 2013 (44 q/ha).However, for the local hybrid, the production ranged between 35 and 40 q/ha. Frontline demonstrations can promote new crops and technologies and improve their popularity. Such improvements in crop technology will help farmers in reducing yield gaps and will improve their knowledge, attitude and skill.

KEYWORDS: Frontline Demonstrations, Maize & DHM 117 Hybrid

Original Article

INTRODUCTION

Maize (*Zea mays* L.) is considered as a miracle crop. It is emerging as the third most important cereal crop, next to rice and wheat. Maize has uses as food, feed and for producing a number of industrial products. It has diverse uses and hidden potential that needs to be exploited by further experimentation. This was why, the renowned Nobel laureate, Norman E Borlaug contemplated that “last two decades saw the revolution in rice and wheat, the next few decades will become the maize era”.

India is the seventh leading producer of maize. The area under cultivation is around 8.11 million hectares. Annually, the production of maize is 18.9 million tons with a productivity of 2335 kg ha^{-1}. In Telangana, the area under cultivation is 0.85 million hectares, with a production of 4.22 million tons and productivity of 4965 kg ha^{-1}.

The productivity of maize may be improved by applying scientific and sustainable management production practices. This is usually achieved by adopting high-yielding varieties. Frontline demonstrations of crop cultivation mainly aim at advertising the newly released crop production technologies and its management practices directly in the farmer’s fields. These are conducted in fields ranging from varying agro-climatic zones. Furthermore, frontline demonstrations help to examine the factors assisting in higher crop production, field

constraints during production, as well as generating production data and farmer's feedback information.

MATERIALS AND METHODS

A total of 20 fields of farmers residing in Mahabubnagar district of south zone of Telangana state were selected for the experimental study. The field studies were conducted by the Krishi Vigyan Kendra, Palem to evaluate the production and economic benefits of maize (DHM 117) production by applying scientific technology. The crop cultivated during the kharif season of 2012-13 and 2013-14 (two consecutive years) and June to October was selected for testing and analyses. The fields of the farmers were located in the village of Chenchugudem, Gudibanda and Chakalpalyy. The experimental study area was 8 ha. Each farmer contributed one acre for the frontline demonstrations. This study was conducted with the active participation of farmers from selected village. Prior to starting the frontline demonstrations, skill training was imparted to the selected farmers and group meetings organized. These training schedules helped the farmer to understand the different aspects of maize cultivation. To promote maize production using scientific technology, constrains in maize production were identified though participatory approach. Knowledge on improved varieties, seed treatment, maintenance of optimum plant stand and recommended fertilizer dose was imparted to the farmers and experimentally tested in their fields. The spacing between crops was0.60 m x0.25 m. Seeds were sown at the rate of 20 kg/ha. Extension gap, technology gap and technology index were calculated using the formulas suggested by Samui *et al*. (2000).

Extension gap (q/ha) = Demonstration yield (qha^{-1}) – yield of local check (qha^{-1})

Technology gap (q/ha) = Potential yield (qha^{-1}) – Demonstration yield (qha^{-1})

Technology index (%) = Potential yield (qha^{-1}) – Demonstration yield/ Potential yield x100

RESULTS AND DISCUSSIONS

Constraints in Maize Production

The various constraints experienced by the farmer during the field application of numerous maize cultivation methods were documented in this study. Preferential ranking of the scientific techniques faced by the respondent farmer helped identify the difficulties that need to be given priority during maize production. The ranking details are listed in Table 1. The lack of availability of high-yielding variety (HYV) (85.00%) at low cost as well as low technical knowledge (85.00%) was considered the major inhibitory factors for successful crop production.

Apart from the non-availability of HYV, low technical knowledge, low or erratic rainfall especially mid-season drought, high labor cost and post-harvest management were identified as important factors influencing maize production. Among all the constraints, low soil fertility was the least concern. Dhaka *et al*., 2010; Ranawat *et al*., 2011; and Sreelakshmi *et al*., 2012have also noted similar concerns for maize production in their studies.

Table 1: Ranking of the Cultivation Constraints by the Farmers

Constraints	Percentage	Rank
Availability of suitable HYV	85.00	I
Labour problem	80.00	III
Low soil fertility	30.00	VII
Marketing	75.00	V
Low technical knowledge	65.00	VI
Wild animals	78.10	IV
Vagaries of weather (Delay onset of monsoon, Early withdrawal of monsoon)	80.57	II

Performance of FLD: The productivity yields of the hybrid (DHM 117) and local crop hybrid were compared. The details are listed in Table 2. For the experimental study period, the productivity of hybrid maize DHM 117 improved on applying production technologies; the productivity ranged from 36 to 54 q/ha (mean yield 44 q/ha)for the cultivation year 2012 and from 39 to 49q/ha (mean yield44 q/ha)for the cultivation year 2013.However, for the local hybrid, the productivity was only 35 and 40 q/ha mean yield for the cultivation years 2012 and 2013, respectively.

The difference in yield between the frontline demonstrations and potential yield of DHM 117hybrid was noted. This helped to determine yield gaps, which helped to calculate the technology index. The technology gap displayed the gap difference between demonstration yield and potential yield (70 q/ha). Technology index indicated the feasibility of the hybrid for cultivation. Technology index and feasibility were noted to be inversely related.

This study indicated an extension gap decreasing from 9.3 to 4.2.The technology gap was 25.7 q/ha. This highlights the urgent requirement to educate and train farmers to lessen the technology gap. This can be achieved by adopting improved agricultural production technologies. The concern by the farmer regarding their lack of technological skills displays their cooperation in this experimental study, which was the main reason for the encouraging results observed. The farmers were eager to adopt the skills taught. The technology gap could also be because of varying soil fertility and unpredictable weather conditions. Mukharji (2003) noted that the farming situation needs to be analyzed to identify the areas that should be focused on. Such an approach with specific intervention will enhance productivity in a systemic manner. A similar approach was suggested by Mitra *et al.* (2010) and Katare*et al.* (2011) as well.

The economic feasibility of improved technology over traditional farming systems was calculated based on the existing input and output costs. For maize cultivation, the cost of production using improved technology led to an increase from Rs.19350 to 20156 ha^{-1} for the hybrid variety DHM 117in comparison to local hybrid varieties atRs18350 to21035 ha^{-1}.Frontline demonstration recorded a higher meannet return (Rs.31705and 34406/ha) with higher benefit cost ratio (3.0, 2.7 and 2.1).

The yield gap between conventional practices and improved production technology was perceptibly higher. Frontline demonstrations yielded better productivity that the local hybrids. Therefore, it can be concluded that adoption of high yielding hybrid resulted in improved productivity. Consequently, this would help improve the economic situation of the farmers, as such practices would result in increased income. This in turn would help enhance the livelihood standards of the farming community.

CONCLUSIONS

New crop varieties and technologies can be promoted with frontline demonstrations. These provide good platforms for advertising the benefits with proven results. Further, these platforms help to improve the knowledge, attitude and skills of farmers, which will help reduce the prevailing yield gaps.

Table 2

Year	Hybrid (ha)	Area	No. of Demonstrations	Potential Yield/ha	Max. Yield	Mini. Yield	Avg. Yield	Local	Extension Gap (q/ha)	Technology Gap (q/ha)	Technology Index (%)
2012	DHM-117	4	10	70	52.6	36	44.3	35	9.3	25.7	36.78
2013	DHM-117	4	10	70	49.5	39	44.2	40	4.2	25.8	36.71
Year	Hybrid(ha)	Area	No.	Total cost of cultivation(Rs./ha)		Gross return (Rs./ha)		Net return (Rs./ha)		Benefit :cost ratio	
				Improved technology	Check	Improved technology	Check	Improved technology	Check	Improved technology	Check
2012	DHM-117	4	10	19350	18350	59125	46354	39775	28004	3.0	2.5
2013	DHM-117	4	10	20156	21035	54562	45080	34406	24045	2.7	2.1

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